UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/802,613	03/17/2004	Daan Veeningen	94.0078	4573

7590 12/23/2008

Danita Maseles, Esquire
Schlumberger Technology Corporation
Suite 1700
5599 San Felipe
Houston, TX 77056-2722

EXAMINER	
ROBERTSON, DAVID	

ART UNIT	PAPER NUMBER
2121	

MAIL DATE	DELIVERY MODE
12/23/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/802,613	VEENINGEN ET AL.	
	Examiner	Art Unit	
	Dave Robertson	2121	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 March 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-43* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-43* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *3/17/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This is a Non-final First Office Action on the Merits on claims 1-44.

Claim Objections

2. The numbering of claims is not in accordance with 37 CFR 1.126: Misnumbered claims 37-43 have been renumbered 38-44 with dependencies to parent claims incremented accordingly. Correction is required.

Double Patenting

3. Claims 1-44 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-70 of copending Application No. 10/802,524. Although the conflicting claims are not identical, they are not patentably distinct from each other because the inventions are directed to substantially similar automated methods of gathering, comparing, ranking, and displaying risk data, wherein the gathering, comparing, ranking, and displaying are related to well-bore (drilling) activities.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1-44 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1, 16, 19, 23 and 38 recites a step of *receiving input data…including a plurality of input data calculation results.* It is unclear what is encompassed by *a plurality of input data calculation results* as no source or manner of producing calculation results are specified. For the purposes of examination the limitation will be interpreted as *a plurality of input data.*

Claims 1, 16, 19, 23, and 38 further recite a step of *generating said risk information* where the antecedent basis for *said risk information* is found only in the preamble of the claims: A method of *determining and displaying risk information in response to a plurality of input data…* Because *said risk information* has no antecedent basis in the body of the claim it may be that this risk information the method will be generating and displaying. However, it is unclear that said risk information to be displayed in the last step of claim 1 is risk information *generated in response to ranked risk values* or some other risk information determined in a manner wholly separate from the generating step. For the purposes of examination the *displaying* step will be interpreted as displaying the *generated risk information* determined in the preceding step or some other risk information determined in response to input data.

Claims not specifically named above depend from one of claims 1, 16, 19, 23, or 38 and are similarly deficient for reason(s) given above for their respective parent claims.

Appropriate amendment or clarification is requested.

Claim Rejections - 35 USC § 101

6. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

7. Claims 1-22 are rejected under 35 U.S.C. 101 based on Supreme Court precedent, and recent Federal Circuit decisions:

> For a process to be patentable subject matter under § 101 the process must (1) be tied to another statutory class of invention (such as a particular apparatus) or (2) transform subject matter to a different state or thing. See Diamond v. Diehr, 450 US 175, 184 (1981); Parker v Flook, 437 US 584, 588 n9 (1978); Gottschalk v. Benson, 409 U.S. 63, 70 (1972); Cochrane v. Deener, 94 US 780, 787-88 (1876). If neither of these requirements is met by the claim, the method is not a patent eligible process. To qualify under § 101 as a statutory process, the claim should positively recite the other statutory class (the thing or product) to which it is tied, for example by identifying the apparatus that accomplishes the method steps, or positively recite the subject matter that is being transformed, for example by identifying the material that is being changed to a different state.

In the present case, none of method (process) claims 1-22 recite transforming subject matter to a different state or thing or positively recite a sufficient tie to another statutory class of invention, such as a particular apparatus. Although the processes manipulate data related to wellbore drilling risk (nominally recited), the manipulations of the data could be performed entirely by a human, by hand, or by mental steps. As such, the invention fails to transform subject matter to a different state or thing and there is no particular apparatus recited for the steps of the method. Therefore, the invention

as claimed is ineligible for patenting and thus nonstatutory subject matter under 35 U.S.C. 101.

Appropriate amendment is required.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claims 1-44 are rejected under 35 U.S.C. 103(c) as being unpatentable over Weinstock et al. (US 6,223,143) in view of Lavu et al. (US Pat. Pub. 2005/0060213), and further in view of Booth et al. ("Meeting Future Drilling Planning and Decision Support Requirements: A New Drilling Simulator," Schlumberger: 2001).

The present invention discloses automated methods for risk analysis of wellbore design properties and displaying the results of said analysis as a function of depth in a wellbore.

Weinstock and Lavu each disclose automated methods of generalized risk assessment, ranking, and display of risk information. Booth discloses display of risk information specific to wellbore design properties and suggests displaying such risk information as a function of wellbore properties including depth of wellbore.

Specifically, with respect to the claims presented:

Claim 1

Weinstock teaches **a method of determining and displaying risk information in response to a plurality of input data , said input data including a plurality of input data calculation results** (see Abstract), **comprising**

generating a plurality of ranked individual risks in response to a ranking step, each of said plurality of ranked individual risks representing an input data calculation result that has been ranked (see ¶[0000] page column line);

generating said risk information in response to said plurality of ranked individual risks (see Figures 16, 17; column 3 lines 24-34); **and**

displaying said risk information, the displaying step including displaying said risk information on a risk information display (see Figure 28).

However, Weinstock does not expressly teach

comparing each calculation result of said plurality of input data calculation results of said input data with each logical expression of a plurality of logical expressions and **...ranking by said logical expression said calculation result...as having either a high risk severity or a medium risk severity or a low risk severity...and displaying said risk information...as a function of depth in a wellbore.** That is, Weinstock, being in the generalized art of risk analysis by ranked risks and risk categories, does not expressly teach applying a set of logical expressions to risk values calculated to determine a high, medium, or low risk severity, and then displaying the risk as a function of depth of a wellbore.

Lavu et al. teaches automated and generalized risk assessment using logical expressions to rank risk values as high, medium, or low risk (see ¶[0018]). Lavu teaches such ranking categories allows display of risk information by risk factor (Figure 8a) to better highlight risks needing varying degrees of attention (see ¶ [0049]). It would have been obvious to one of ordinary skill in the art at the time of the invention to improve Weinstock by categorizing risks as high, medium, and low risks and to display such risk information as this would have provided the user risk information drawing attention to risks needing varying degrees of immediate attention.

Booth expressly teaches visualization techniques for display risk information associated with the depth of a wellbore on a 3D model of the Earth (see Booth, page 4, 'Wellbore state window') which in Real-time Mode, displays a wellbore trajectory, nature, and severity of the failure mechanisms (page 4, right column), the wellbore state window showing the true vertical depth and measure depth…together with 'traffic light information' for a set of risks.' Booth teaches that such visualizations provide an integrated process for well-planning and real-time decision support to optimize performance while drilling (see Booth, Abstract and Introduction).

It would have been obvious to one of ordinary skill in the art at the time of the invention to improve Weinstock and Lavu with the visualization techniques disclosed by Booth, including the display of risk information as a function of depth of wellbore. As Weinstock and Lavu provides a method of calculating generalized risks from input data, including categorized risks and risks determined as high, medium, and low severity, Booth merely provides *display* of such risks in a manner conducive to real-time control

or optimization by a wellbore drill planner or operator, thereby helping to minimize cost and the associated risk of construction techniques for wellbore drilling.

Claims 2 and 3

Weinstock and Lavu teach claim 1 as above, however, do not expressly teach **risk information display[ed] as a function of depth in said wellbore include[ing] a …a color representing each said severity** or **…a numerical value representing each said severity.**

Booth expressly teaches display of risk severity as a function of depth of a wellbore, including display of a numerical value (see Figures 11, 12) and color (see page 3, right column, item 4; page 4 'Wellbore state window').

It would have been obvious to one of ordinary skill in the art at the time of the invention to improve Weinstock and Lavu with the visualization techniques disclosed by Booth, including the display of risk information as a function of depth of wellbore. As Weinstock and Lavu provides a method of calculating generalized risks from input data, including categorized risks and risks determined as high, medium, and low severity, Booth merely provides *display* of such risks in a manner conducive to real-time control or optimization by a wellbore drill planner or operator, thereby helping to minimize cost and the associated risk of construction techniques for wellbore drilling.

Claims 4-7 recite the substantially the methods of claims 1-3, however, displaying **one or more ranked subcategory risks.** As Weinstock teaches generating subcategory risk information (see Figure 6 and related; Failure Mode is a "subcategory" of Subsystem risk) and suggests with Lavu and Booth display of risk information by

depth of wellbore (see above), for substantially the reasons given above Weinstock teaches or suggests generating and displays *subcategory risks* as in claims 4-7.

Claim 8

Weinstock teaches **subcategory risks selected from a group consisting of gains risks, losses risks, stuck pipe risks, and mechanical risks** (see Figure 28; e.g. 'Housing Structural Failure' is a mechanical risk).

Claims 9 and 10

Weinstock teaches **wherein said risk information displayed on said risk information display comprises one or more risk categories** (see Figure 5A, Item 59; and above for display of risk information); and further **wherein said one or more risk categories includes a total risk, said risk information display including said total risk displayed on said risk information display as a function of depth in said wellbore** (see Figure 5A, Item 59; and above for display of risk information).

Claim 11

Weinstock teaches **risk categories selected from a group consisting of an average individual risk, a subcategory risk, an average subcategory risk, a total risk, an average total risk, a potential risk for each design task, and an actual risk for each design task** (see Figure 28 showing potential risk for a design task).

Claims 12-14 recite limitations substantially as recited above in claims 1-11 and are similarly rejected for reasons given above for the respective claim and claim elements.

Claim 15

Weinstock does not expressly teach **wherein said individual risks are selected from a group consisting of [a set of risks associated with wellbore drilling].**

Booth expressly teaches individual risk data associated with wellbore drilling. It would have been obvious to one of ordinary skill in the art at the time of the invention that such data may be entered into Weinstock's generalized risk assessment system, and when combined with the displays suggested by Booth, provide the user of such data automated means of evaluating risks associated with this particular application area, thereby leading to minimization of cost and risk associated with wellbore drilling planning and design.

Claim 16 recites limitations substantially as recited above in claims 1-15 and are similarly rejected for reasons given above for the respective claim and claim elements.

Claim 17

Weinstock teaches or suggests claims 1-16 as above, and further that minimization of cost and risk is performed for the design (planning phase) to show potential risk (see page 3) and for real-time control (see page 4). Therefore, Weinstock teaches risks including **an actual risk and a potential risk** and **display of said actual risk associated with each of said design tasks and a display of said potential risk associated with each of said design tasks.**

Claim 18

Weinstock teaches **wherein said display of each of said design tasks on said risk information display further includes a plot comprising said actual risk on one**

axis and said potential risk on another axis and a display of each said design task on said plot (see Figure 12).

Claim 19 recites limitations substantially as recited above in claims 1-15 and are similarly rejected for reasons given above for the respective claim and claim elements, noting that display by a function depth and display by a function of length is merely a matter of orientation of the wellbore.

Claims 20-22

Weinstock does not expressly teach **a three-dimensional display of a corresponding plurality of cylinders extending along a length of said wellbore, each of said cylinders representing one of said plurality of ranked individual risks [claim 20]**...**wherein each of said cylinders which represent one of said ranked individual risks has a color, said color representing a severity of said one of said ranked individual risks [claim 21]** or **wherein each of said cylinders which represent one of said ranked individual risks has a size, said size representing a severity of said one of said 10 ranked individual risks [claim 22].**

However, Booth (page 4 'Wellbore state window') expressly teaches displaying individual risks "as a blue shaded cylinder" (a cylinder being a three-dimensional object) as a visualization technique for enhancing the designer/operator's view of the wellbore design or operating risk. Official notice is taken as old and well known that display of numerical values for comparison by adjusting the size of an object used to represent the numerical value provides an efficient means of communicating relative value a human operator. It would have been obvious to one of ordinary skill in the art at the time of the

invention to display Weinstock's risk information using Booth's visualization technique as Booth's technique is particularly suited to the application of risk information display, and to use *size* as a communication means to show relative risk value, thereby helping to minimize cost and risk in the wellbore design and operation by providing efficient and effective communication to an operator or designer of the wellbore analysis tool.

Claims 23-44 recite a program device for performing substantially the method(s) of claims 1-22, and are similarly rejected for reasons given above for the respective claim and claim elements, and further that Weinstock discloses automated methods embodied on computer readable media (see Figure 2).

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

Stoltz (US Appl. Pub. No. 2003/0125997) and Packwood (US Pat. No. 7,006,992) and Tschiegg, et al. (US Appl. Pub. No. 2005/0192963) and Miller, et al. (US Appl. Pub. No. 2005/0021360) and Bladen, et al. (US Appl. Pub. No. 2002/0099586) teach automated methods and systems for generalized risk assessment with substantial features of the claimed invention.

Aldred et al. (US Pat. No. 7,003,439) and Koederitz et al. (US Pat. No. 7,243,735) teach automated methods for minimizing risk and ensuring design success for wellbore operations.

Goldman et al. (US Pat. No. 6,109,368), Goldman et al. (US Pat. No. 7,032,689), Goldman et al. (US Pat. No. 6,408,953), King (US Pat. No. 6,612,382), Goldman et al. (US Pat. No. 7,261,167), King (US Pat. No. 7,085,696) and Goldman et al. (US Pat. No. 7,357,196) teach automated methods and a system for predicting performance of a drilling system for a given Earth formation.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dave Robertson whose telephone number is (571)272-8220. The examiner can normally be reached on 9 am to 5 pm, M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Albert Decady can be reached on (571) 272-3819. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Albert DeCady/
Supervisory Patent Examiner, Art Unit 2121

/Dave Robertson/
Examiner, Art Unit 2121